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Cuesta Topography of the Crimean Peninsula

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CUESTA TOPOGRAPHY OF THE CRIMEAN PENINSULA.

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(Abstract.)

At the last meeting of the Academy I discussed briefly some aspects of the geographic development of the Crimea and the northern borders of the Black sea. Since that time certain of the photographs obtained by those who took part in the geological excursions following the International Congress of Geologists, have been received. It is to one of these especially that I now wish to direct your attention. It shows very clearly certain phases of the surface relief of which mention was made last year, and in a way that is rarely ever exhibited to such a great advantage or to such an extent. The photograph is one taken by Mr. R. T. Mallet of London, who was a member of the party. It is through his kindness I am now able to present it to you.

The photograph (plate vii) is, I think, the best one ever secured showing what modern geographers term Cuesta relief. The word cuesta is a recent American acquisition from the Spanish. It is a common word, used in southwestern United States and Mexico to express the same idea that we do by step-and-platform topography. The short, simple and expressive word has been seized with avidity and has been used widely in place of the longer phrase.

The development of the Cuesta type of surface relief is, briefly, this: A region of slightly tilled strata composed of alternating hard and soft beds is planed off or worn down to a peneplain, or a base-level plain. This grade-plain is one of faint relief, lying slightly above sea level. When such a region again suffers differential uplifting, the agencies of erosion actively begin to work anew Long lateral valleys are soon opened out in the soft strata along the strike of the rocks or at right angles to the direction of greatest dips. These

valleys are connected by narrow gorges. Abrupt escarpments form one side of the lateral valleys and long back-slopes the other. A series of gigantic steps are formed. The idea is best expressed by a cross-section (figure 4), which is a diagrammatic one, of the same region in which the photograph was taken.

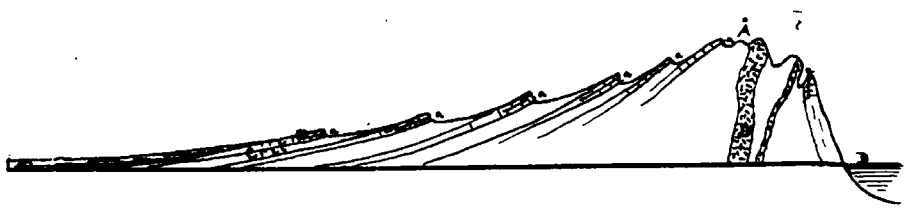

FIG. 4. Cross-section of the Crimea.

In this country we have some excellent examples of this type of topography. Besides the great areas in southwest United States, the Black Hills and Ozarks furnish excellent examples, but they are all on such a large scale that the camera cannot satisfactorily reproduce them. Nowhere in this country is it depicted so beautifully as in the region photographed. The photograph was taken from the crest of one of the lofty escarpments, just outside of the southern gates of the ancient city of Chufut Kaleh, formerly occupied by the Karaim Jews, but long since deserted and now in ruins. This point is about five miles from Bakhchisarai, 300 years ago the capital of the Tartar Khans, and about forty miles from Sevastopol. The resistant numbers of the couplets forming the escarpments are chalky limestones of Cretaceous age. To the north they are covered by Tertiary deposits.

In Iowa we have traces of an excellent illustration of Cuesta topography, in the area occupied by the upper coal measures of the southwestern part of the state. It is best shown, perhaps, in Madison county. Elsewhere it is greatly obscured by heavy drift deposits, which almost completely bury the highest escarpments. Only here and there do the latter peep out through the glacial *debris*. The broad, intervening valleys that once existed are filled by surface deposits to a depth often of 200 feet.